The Application of Mathematical Magic to Investment Returns—(01/01/2015)

It is a new year. It’s a time in which stock market predictions for 2015 are everywhere. And with the recent rally in the stock market almost everyone is predicting more gains to come. And people trading the stock market are craving stock picks.

There will be no predictions about where the market is going to go this year in this month’s newsletter. And there is not a single stock pick to be had in it.

Instead there will be something much more valuable for you inside of it. When people start out in the trading world they search for a way to find stocks to buy or trades to get into.

They think that this is the secret to success and believe that if they can get a good entry and exit system they can make money in the markets.

They are right, but there is something deeper to learn. When I first got into the markets I turned 15k into 50k in the manner of a few weeks and then turned that 50k into about 7k.

I was forced to learn and make changes if I wanted to make money and not lose. And that was I had to figure out a good way to pick out trades to make instead of just throw money at things like a wild gambler.

I tell that story in my book Strategic Stock Trading and share with you the simple chart patterns I found to be the most profitable in it. Everyone
also thinks that they need to focus on what direction the market is going or some big new trend to make money too.

They think that if they can ride the next big wave they can make a killing. And if they are invested in the market they convince themselves that the market is just going to go up forever for them like you hear everyone say on CNBC right now if you turn it on.

In fact CNBC and the financial media in general is full of non-stop stock picks and predictions. Yes all of this does have its place, and does play a role in making money in the stock market, but it is more limited than people realize. You do need to get things right. When you talk about the markets with people whether they be people just starting out or professional money managers almost every single conversation you have with people is all about where they think things are going.

And you can make money by getting things right. Once I figured out way back around the 1998-1999 time period a repeating trading pattern that worked for awhile I started to make money and have made money in almost every single year in the markets ever since then. It was a big turning point for me. But not every month and not every week was a winner and it is a tough road of big swings up and down.

Twelve years ago I managed a hedge fund for a few years, but shut it down even though it beat the market over the period of time I was managing it, because I simply found it too stressful to try to trade big swings to make money for people. I found that I did not like to risk other people’s money like that.

Over the past few weeks I have had an epiphany of sorts about the trading and investment world that is as big of a turning point for me as when I first learned to trade successfully when I started out. I am going to begin to share with you in this newsletter what I have learned. I am going to continue to study this topic the rest of this year and eventually put together a book or series of videos about it. But today will be an introduction to you about it with some ideas you can easily apply this year that I believe can help you generate a better return. I am going to reveal to you the real way the most successful institutional investors really make money. This is their “secret sauce.” It isn’t secret stock picks or computers predicting markets moves that is the key for them.

After what has been a challenging year for me in 2014 thanks to a big position in gold and mining stocks I decided to search for a better way to manage my money. I wanted to find a way to make better returns with less risk and less volatility in my accounts. I know how to pick things out and look for new bull markets, but I wanted to find a better way to get into things.

I also have come to believe that what most people are doing in the stock market is simple gambling. I have played poker over the years from time to time in casinos and there are a lot of similarities when it comes
to poker psychology to trading. But it may be that this stock trading game is actually more akin to sports betting or horse betting than poker.

I’m really not a big casino gambler. For me little poker tournaments are a fun game. But I started to look at sports and horse betting to see what I could learn there and if it could be applied to investing. Go in a sports book room in a casino and you’ll find people trying to make bets on games. They are trying to predict the outcome of games and bet on them. Recently I went to a casino in Charlestown, WV. I went and lost about $100 playing a poker tournament for six hours. I got to the end just out of the money. But I really went there because it has one of the biggest horse tracks in the world and is full of horse gamblers. It had an off-track betting center that plugged the gamblers in to every other major horse race in the country.

I hoped to meet someone in there that was a successful horse gambler to talk to them about bankroll and money management and see if I could learn anything. What I found were people who appeared to be betting nonstop and trying to pick out winners in every race. It seemed unlikely to me that any of them were making money. You can see from the pictures that their eyes were fixed on the television monitors.

They all seemed to love the action and I thought they could just have well been stock market players watching the stock market tickers fluctuate on CNBC. It is stock picks that captivate the investing masses just as it is horse betting picks that the racetrack gambler is ad-
dicted to. But this is not what I was looking for. So I went to a bar area and talked to the people working there asking them if there were any regulars who knew what they doing.

Yes there was an older gentleman there with what looked like a grand-kid in his twenties. They were there to bet on one single race. He knew everything about the jockey and the other horses.

I asked him about money management and he talked about the Kelly betting criterion. You may want to look it up and see how it works.

Poker pro Phil Ivey got in the news in 2014 for playing an “edge system” in a casino and making $12 million dollars. They refused to pay him and he took the casino to court and lost. In an interview he said he had a 5% edge.

The man who invented counting cards when it comes to blackjack was a man named Edward Thorp. He wrote a book about it called Beat the Dealer. People focus on the counting cards aspect, but it really works because of the way the system manages the bets. It looks for times of a 5% advantage and then does something similar to the Kelly criterion betting system. The most successful betting systems are based on it.

Thorp couldn’t go in casinos and count cards without getting banned so he had people go into sports book rooms for him and used the Kelly system to make millions on games where he thought he had a 5% edge on the odds. When the bags of money got too big he started to think it would be too dangerous for his agents to going into casinos with them. So for fun he went to the race track and did the same thing there. Then he started what was one of the most successful hedge fund partnerships of the 1970 and 80’s.

Thorp wasn’t the only mathematician to study gambling and stock investing. There were several key ones who wrote studies over the decades about money management and stock returns based on the Kelly criterion. Today they are the basis of what is called in academia quantitative finance.

They also provide the theoretical basis for trading and investing strategies today used by hedge funds and institutional investors. They are being used in computer trading and in portfolio asset allocation systems. This is really a new field that has emerged in the past twenty years and I have been studying the text books and history of it.

One of the key figures in the field was Claude Shannon, pictured on the right, who graduated from MIT at
the age of 21. He was one of the top cryptographers for the US military during World War II, but more importantly is known as the founder of computer “information theory” and came up the basics of “circuit design” in 1937. He created Boolean theory which is the basis of computer language. For fun he hung out with Edward Thorp and also got interested, perhaps obsessed, with the stock market.

Between 1966 and 1971 he gave a series of talks to a packed lecture hall at MIT about the stock market. At one of them he revealed a mathematical discovery. His friend’s called it “Shannon’s demon.”

He said that you could make money off of the movements of stocks without knowing what direction they were going to move. Imagine a volatile stock that simply moves randomly up and down every single day. Put half of your money into that stock and half into cash in your brokerage account.

At noon every day you rebalance your portfolio to maintain this 50/50 asset allocation. So if by noon the stock goes up you sell some of the stock to realize the profits and move them into cash to maintain the 50/50 balance. If instead at noon the stock were to be down you would buy extra shares with the cash to get back to the 50/50 allocation.

Now imagine that the stock doubles one day and then falls in half the next. And then day after day makes similar giant moves up and down. And you rebalance your account every single day. Not only that, but the results would actually be LESS volatile than if one simply put 100% of their money into the stock and held it. In fact in that case odds are they would make hardly anything.

What happens is when the stock goes up you sell some of it and when it goes down you buy some of it in order to maintain the 50/50 asset bal-

![Shannon's Demon Graph](image-url)
Simulations show that if you started out doing this with $1.00 on a stock that doubles or falls in half every single day in 240 days that one single dollar would turn into a million.

How does this happen? It’s mathematical magic. The arithmetic mean return is higher than the geometric mean. All of the up days add up if the profits are partially realized. What is being harvested is volatility.

Now after Shannon gave this presentation someone asked him the obvious question, which is why doesn't he do this himself? The answer is simple. The commissions would eat you alive and you would need a stock so volatile that it doubles or falls in half every single day.

Other mathematicians have built off of this idea though. One is Thomas Cover who did a study to see what would happen if you owned every single stock in the stock market and rebalanced a portfolio so it owned the same fixed percentage of them every single day. Guess what happened. It beat the market.

Of course who wants to do that with every stock in the market? Transaction costs would be extreme. Well, some of the largest hedge funds and institutional investors in the world are rebalancing their portfolios like this every single day. I believe it is their secret to success.

I have recommended the book the Ivy Portfolio by Mebane Faber several times. It examines the Yale and Harvard endowment funds that have beat the stock market over the past decade by investing in a diverse mix of asset classes. These two funds maintain a fixed rate of asset allocation every single year. They never have more than 15% of their money for example invested in the US stock market and yet they still beat the market.

The book is worth buying to understand asset allocation. But what is really making them beat the market is that they are rebalancing their portfolio every single day. These funds are beating the market with billions of dollars under management and barely lost anything during the 2008 stock market crash. They are applying the volatility harvesting strategy that Claude Shannon revealed in his speech to boost returns and lower the volatility of the entire portfolio as a whole.

The ideal portfolio that is as close to perfect as you can get from a risk to reward standpoint is one that is invested in a mix of markets and assets that are as uncorrelated with one another as possible and has no more than 20% of it’s money devoted to any one single asset class or market. By uncorrelated what I mean is that the markets and asset classes being invested in are not trading together. So when one goes up another goes down or they really have no relationship to one another at all. Such a portfolio would hardly ever lose any money and is likely to beat the US stock market every single year, unless there is a fluke year off of a bear market bottom in which it is up 100% or something.

Of course there is no perfect mix of five assets that are totally uncorrelated with another and the correlation relationship between two dif-
different assets can change from time to time. But we have to think in such an ideal to think and work towards it. And it is this that the Yale and Harvard money managers are really providing to their investors even if the uninitiated imagines that it is super stock picking research and predictions about the future they are good at.

If you are curious you can examine the correlation between various ETF’s and stocks of your choice here:

http://www.investspy.com/calculator

With an institutional portfolio management computer program I have been running simulations using historical data to study rebalancing strategies. One thing I have found is that if you use ETF’s you do not need to do daily rebalancing, because there is not much difference in the end result between daily and weekly rebalancing. Monthly rebalancing is better than none at all, but weekly seems to be best. Annual would be better than nothing, but isn’t that much better than doing nothing to get better gains. It’s good though for preventing losses. Let me show you some simple interesting examples.

Think about the US stock market. It has gone up a lot since 2009 and US stock market bulls at the moment are extremely bulled up. If you talk to them they will tell you that the only thing worth investing in is the US stock market and if you had put all of your money in just the S&P 500 ETF a few years ago then you would have made a fortune so you should do that right now. Of course you would have suffered in 2008, but that is a distant memory right now.

If you would have put all of your money into the SPY ETF that tracks the S&P 500 on January 1, 2007 you would be up about 55% right now from that date. You also would have suffered through a 67% decline during the 2008-2009 bear market.

That’s what you see on the chart to the right. This is what a portfolio 100% invested at all times in the SPY would have done over the past seven years.

Now something interesting would have happened if you would have put half of your money into TLT, which is the ETF for the year 20-year US treasury bond, and half into SPY starting on January 1, 2007. Now since then TLT is up 34% so it is up much less than the gain realized by SPY since then. So if you would have put half your money in both starting
then and just watched it all you would be up 44.50% since then. Now you would have had a lot smaller drawdown during the 2008-2009 bear market so you would have been very happy then, but today you might be regretful about now having made 55%. But in turn someone can say that the safety of being more diversified now and not losing your ass in 2008 was worth making a little less.

However, if you put half your money in both the TLT and SPY and rebalanced those positions every week to maintain the 50/50 ratio something interesting would have happened. You would have made a 63% return by now and only been down roughly 22% during the nasty bear market of 2008-2009 instead of the 67% drawdown suffered by those invested only in the S&P 500 during that time. In other words a portfolio that was 50/50 invested in US stocks and bonds and rebalanced to maintain that 50/50 ratio every single week would have generated market returns that beat not only the US
stock market, but just about every single hedge fund and money manager on the planet. And it would have done that with less risk.

This is the magic of volatility harvesting and portfolio rebalancing. It can generate bigger returns with less risk if the portfolio is invested in the right mix of asset classes. The reason why TLT would have helped supercharge a portfolio mixed with SPY is because those two assets have had a negative correlation with one another during this time frame.

What would have happened if you would have added gold, through the GLD ETF to this backtest? Since January 1, 2007 gold prices are up 37%, which is in line with what TLT has done, but is behind the 55% gain in the S&P 500. In fact most stock bulls on CNBC have said gold is stupid to own, because of such performance results. They are wrong. If 33% of your money was put into a portfolio evenly in GLD, SPY, and TLT on January 1, 2007 the results today would have been incredible. Such a portfolio would
Gold, TLT, and SPY have all been negatively correlated with one another since 2007. There are a lot of implications to all of this. One obvious one is that gold can play an important role in any portfolio. But there are many others and next year I am going to be spending a lot of time studying this concept and the school of quantitative finance as a whole. Right now my goal is to get myself into a position overtime where I am invested in several 20% core positions that are rebalanced like this. With gold and mining stocks that means I consider a 20% position a core position to hold and anything above that only for short-term trading. This is changing the way I am going to invest for now on in them. And the same goes with any other market or asset class.

However, I am not suggesting that you put 1/3 of your money in gld, tlt, and spy as in the example, although such a mix that is rebalanced every week is likely to continue to do better than simply owning the US stock market for the next few years. I am suggesting though that for one to have 100% of their money only invested in the US stock market right now is total foolishness. Not only do you risk a large loss the next time a bear market comes if you do that which you may never recover from, and I believe we are headed for one, but it’s not necessary to be 100% invested in the US stock market either in order to beat it. It’s just a damn dumb thing to do. If you are 100% invested in the US stock market for goodness sake DIVERSIFY!!!!! Do not become a DOW DUMMY no matter what the TV tells you to do!

I am convinced that this rebalancing magic is the key thing driving the investment returns of some of the largest institutional investors today operating inside the stock market. If you look at their annual reports few of them though own gold right now. One thing that is making rebalancing work for them is the big position almost all of them have in bonds, because of the fact that they have tended to go up when the US stock market falls.

At some point in the future, and it may be a few years away from today, I fear a time will come in which US bonds will go into a bear market while the stock market is falling too. We have actually already seen junk bonds decline during times of stock market weakness in the past few months.

If Treasury bonds were to go into a bear market as the stock market is declining than all of these giant institutional players will have to find a rebalancing replacement for them. They will be FORCED to do so. And that means that they will literally be FORCED to put money into gold.

Gold prices would skyrocket as a result. This is something to think about.

I have been looking at some of the correlation relationships of individual stocks and sectors and the US stock market averages and have no-
ticed some interesting things. Of course gold and gold stocks have a negative correlation to the broad market. Interestingly so does the bio-
tech sector and Facebook stock!

Biotech is an overvalued bubble sector. But it went up a lot for a few weeks right after the October stock market drop. One wonders if some hedge fund computer programs are using these correlation relationships to figure out where to move money in and out of. Maybe that is why biotech popped in October. What happens if you apply this thinking to individual stocks?

Well Facebook is one of the most overvalued stocks I’ve ever seen in the stock market. It has a P/E of 72 and forward P/E of 41. It has a crazy $250 billion market cap and is run by a CEO that is creepy.

Who in their right mind buys that now as an investment? And yet Facebook stock has been one of the best performing stocks in the market this year. When it came out I thought it was going to be a bad buy, but it has gone up and surprised me.

It has become one of the most widely owned stocks by hedge funds and is now one of the top trading volume stocks on the exchanges.

It also has one of the largest negative correlation relationships to the broad market averages of any big cap stock in the US stock market.

That’s interesting. That would mean there could be hedge funds using FB to profit from portfolio rebalancing just as they would from Treasury bonds. Of course if the FB bubble bursts that game is over.

This is today’s world of investing. And such a correlation relationship between FB and the stock market can suddenly change at any moment, although it is likely to last at least for several more months.

It’s interesting. There are a lot of applications to using this type of math and analysis to investing. One can keep things very simple though with ETF’s and do powerful things to control the risk in one’s account and work towards high returns at the same time. But one level of investing is figuring out what is likely to go up and what stocks are good and then another level is applying this type of money management rebalancing to that analysis. This stock market game is a competition in which the superior money managers win.

Next year is going to be a year of change in my opinion in the markets. I think the US stock market is at high risk of going into a bear market, but at the same time we will see new markets in the future go into brand new bull markets. They will be attractive places for new core 20% positions in my view. Not only is there gold, but one day now oil and oil stocks, and other commodities will be buys. Plus there are other markets in the world that are likely to have major bottoms one day such as Russia and go into new bull markets again such as Greece to name just two. With a whole world of markets and various asset classes there is a lot of opportunities now available to investors like never before.

So here is to the coming year!
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